

REMARKS

Applicants request favorable reconsideration and allowance of the subject application in view of the preceding amendments and the following remarks.

Claims Pending

Claims 1 and 7-16 are pending. Claim 1 is the sole independent claim. Claims 1 and 12-16 have been amended, while Claim 6 has been canceled without prejudice to or disclaimer of its subject matter. Support for these changes can be found in the original application, as filed. Accordingly, no new matter has been added.

Substitute Specification

Applicants are submitting herewith clean and marked-up copies of a substitute specification to correct minor and typographical errors therein. More specifically, the value of the ratio of the calcium compound (e.g., calcium chloride) to the dispersant is incorrect as a result of a calculation error in the various examples of the inks Y-1 through Y-12, Bk-1 through Bk-9, M1 through C-9, and C-1 through C-9. The values given in the specification for this ratio are based on the atomic weight of calcium alone, rather than being based on the atomic weight of the entire calcium compound (e.g., the atomic weight of both calcium and chlorine). Accordingly, the attached clean and marked-up copies of the substitute specification provide the correct values for this ratio, based on the atomic weight of the entire calcium compound.

Because 1) the values that form the basis of these calculations are all found in the original specification, 2) the calculation itself is merely the calculation of a conventional weight ratio, which is known to those skilled in the art, 3) the specification states that the weight ratio is calculated (i.e., page 25, lines 3 and 4 of paragraph [0056] of the original specification states “Determination was conducted of a weight ratio of the calcium compound to the high-molecular dispersant”), and 4) the original disclosure clearly indicates that the calculated ratio is for the calcium compound rather than calcium alone, Applicants submit that corrected values found in the attached substitute specification are not new matter.

For the Examiner’s convenience, Applicants will discuss how the corrected ratio, as listed in the substitute specification, was calculated for the example of yellow ink Y-1 discussed at paragraphs [0054] through [0056]. The correct values for the other inks in the substitute specification are calculated in the same way.

As discussed in paragraphs [0054] and [0055], the colorant dispersion Y-1 consists of C.I. Pigment Yellow (1.0 weight part), the high-molecular dispersant A (1.0 weight part) and water (10.0 weight parts), due to the removal of the solvent (acetone). Therefore, the weight percentage of the high-molecular dispersant A in the colorant dispersion Y-1 can be calculated as follows:

$$1/(1+10+1) = 1/12 = 8.33 \text{ wt.}\%$$

As can be seen from paragraph [0055], the total amount of the ink Y-1 is calculated to be 100 weight parts by adding the amounts of its ingredients (i.e., 50.0 parts (colorant dispersion)

+10.0 parts (triethylene glycol) +10.0 parts (tripropylene glycol) +1.0 part (an aqueous solution of 2% calcium chloride) +1.0 part (an aqueous solution of aluminum hydroxide) + 28.0 parts (deionized water) = 100 weight parts).

The content of the high-molecular dispersant A in the ink Y-1 can, therefore be calculated as follows:

The content of the high-molecular dispersant A in the ink Y-1 =

$$50 \times 8.33/100 = 4.165 \text{ wt.}\%$$

Since the calcium chloride is in a 0.2% calcium chloride aqueous solution, the weight percentage of calcium chloride is

$$0.2\% \times (1.0 \text{ part}/100 \text{ parts}) \times 100\% = 0.002 \text{ wt. } \%$$

Therefore, the ratio of calcium chloride to the high molecular dispersant A is

$$0.002:4.165 \text{ or approximately } 1:2,083.$$

However, in the specification as filed, this ratio is described as "1:5,800" (see page 26, line 3). Accordingly, the attached substitute specification corrects this error and the errors in the other ratios for the other ink examples.

Rejection

Claims 1 and 6-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Publication No. 2002/0180854 to Sato et al. in view of U.S. Patent No. 6,075,069 to Takemoto.

Amendments to Claim 1

In response, while not conceding the propriety of the rejection, independent Claim 1 has been amended. Applicants submit that as amended, Claim 1 is allowable for the following reasons.

Independent Claim 1 relates to an inkjet recording ink comprising a high-molecular dispersant, and a water-insoluble colorant encapsulated with the high-molecular dispersant. The colorant is at least one colorant selected from the group consisting of C.I. Pigment Yellow 3, C.I. Pigment Yellow 74, C.I. Pigment Yellow 93, C.I. Pigment Yellow 95, C.I. Pigment Yellow 109, C.I. Pigment Yellow 120, C.I. Pigment Yellow 128, C.I. Pigment Yellow 138, C.I. Pigment Yellow 151, C.I. Pigment Yellow 175, C.I. Pigment Yellow 183, C.I. Pigment Yellow 184, C.I. Pigment Black 1, C.I. Pigment Black 7, C.I. Pigment Black 10, C.I. Pigment Black 31, C.I. Pigment Black 32, C.I. Pigment Red 12, C.I. Pigment Red 122, C.I. Pigment Red 184, C.I. Pigment Red 202, C.I. Pigment Violet 19, C.I. Pigment Violet 32, C.I. Pigment Blue 15:1, C.I. Pigment Blue 15:2, C.I. Pigment Blue 15:3, C.I. Pigment Blue 15:4, C.I. Pigment Blue 15:6, C.I. Pigment Blue 16, and C.I. Pigment Green 7. The ink also comprises a water-soluble organic solvent, at least one compound selected from the group consisting of a calcium compound and a magnesium compound, an aluminum compound, and water. The high-molecular dispersant is a block copolymer comprising at least one hydrophobic block and at least one hydrophilic block. The at least one hydrophobic block and the at least one hydrophilic block have been obtained by polymerizing vinyl ethers as monomers, respectively. The content of the aluminum

compound in the ink is from 1:300 to 1:20 in terms of a molar ratio of the aluminum compound to the high-molecular dispersant.

Claim 1 has been amended to recite that the weight percent of the calcium compound to the inkjet recording ink and the weight percent of the magnesium compound to the inkjet recording ink are in the range of from 0.00015 wt.% to 0.05 wt.%. In addition, Claim 1 has also been amended to recite that the weight percent of the aluminum compound to the inkjet recording ink is in the range of from 0.00002 wt.% to 0.002 wt.%.

The ranges for the weight percentages are supported by the different examples provided in the specification.

More specifically, the lower end of the range for the calcium compound, 0.00015 wt%, is supported, for example, by the example ink Y-4. In this example, discussed in paragraph [0064], 0.3 parts of a 0.05% calcium chloride solution is used. As a result, the weight percentage of calcium chloride is $0.3 \times 0.05\% = 0.00015 \text{ wt}\%$. The upper end of the range for the calcium compound, 0.05 wt%, is supported, for example, by the example ink Y-2. In this example, discussed in paragraph [0058], 1.0 part of a 5% calcium chloride solution is used. As a result, the weight percentage of calcium chloride is $1 \times 5\% = 0.05 \text{ wt}\%$.

The lower end of the range for the aluminum compound, 0.00002 wt%, is supported, for example, by the example ink Y-9. In this example, discussed in paragraph [0083], 0.2 parts of a 0.01% aluminum chloride solution is used. As a result, the weight percentage of aluminum chloride is $0.2 \times 0.01\% = 0.00002 \text{ wt}\%$. The upper end of the range for the

aluminum compound, 0.002 wt%, is supported, for example, by the example ink Y-8. In this example, discussed in paragraph [0078], 1.0 parts of a 0.2% aluminum chloride solution is used. As a result, the weight percentage of aluminum chloride is $1 \times 0.2\% = 0.02 \text{ wt\%}$.

For the Examiner's convenience, below is a table summarizing the weight percentages of the calcium and aluminum compounds for inks Y-1 through Y-12.

Ink	Concentration of Ca compound (wt.%)	Concentration of Al compound (wt.%)
Y-1	0.002	0.0001
Y-2	0.05	0.00003
Y-3	0.00025	0.0004
Y-4	0.00015	0.0001
Y-5	0.001	0.00005
Y-6	0.01	0.0001
Y-7	0.001	0.00005
Y-8	0.002	0.002
Y-9	0.0002	0.00002
Y-10	0.002	0.0001
Y-11	0.002	0.0001
Y-12	0.002	0.0001

In contrast, the citations to Sato et al. and Takemoto are not understood to disclose or suggest an inkjet recording ink comprising, in part, an aluminum compound and at least one compound selected from the group consisting of a calcium compound and a magnesium compound, in which 1) the weight percent of the calcium compound to the inkjet recording ink and the weight percent of the magnesium compound to the inkjet recording ink are in the range of from 0.00015 wt.% to 0.05 wt.%, or 2) the weight percent of the aluminum compound to the inkjet recording ink is in the range of from 0.00002 wt.% to 0.002 wt.%, as recited by amended Claim 1.

Rather, page 4 of the Office Action admits that the citation to Sato et al. does not include at least one compound selected from the group consisting of a calcium compound and a magnesium compound, or an aluminum compound, as recited by Claim 1. And the Takemoto citation is understood to merely discloses that the concentration of polyvalent metal salt in the ink composition is preferably about 0.1 to 40% by weight, and more preferably, about 5 to 25% by weight, as discussed at column 4, lines 1-3 thereof.

Since the citations to Sato et al. and Takemoto are not understood to disclose or suggest at least two features of amended Claim 1, Applicants submit that the Office has not yet satisfied its burden of proof to establish a prima facie case of obviousness against amended Claim 1. Therefore, Applicants respectfully request that the rejection of Claim 1 be withdrawn.

Dependent Claims 7-16, likewise should be deemed allowable in their own right, for defining other patentable features of the present invention in addition to those recited in

independent Claim 1. Individual consideration of the dependent claims is respectfully requested.

Applicants respectfully request that this Amendment be entered. This Amendment was not presently earlier because Applicants believed that the prior Amendment placed the application in condition for allowance. In addition, Applicants submit that this Amendment renders the case allowable. Accordingly, entry of the instant Amendment is respectfully solicited.

Conclusion

In view of the above amendments and remarks, the application is now in allowable form and entry of this amendment is considered proper. Therefore, early passage to issue is respectfully solicited.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should be directed to our address listed below.

Respectfully submitted,

/Gary M. Jacobs/

Gary M. Jacobs
Attorney for Applicants
Registration No. 28,861

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3800
Facsimile: (212) 218-2200

GMJ/SEW/MLB

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